These guidelines are broken down into three sections:

I. Introduction
II. Incident Classification and Responses
III. First Responder Operations

INTRODUCTION

Hazardous Materials Incidents pose a multitude of health and safety concerns, any one of which could result in serious injury or death. These hazards are a function of the incident, as well as a consequence of the work being performed. They may include singularly or in combination, the following factors:

- Chemical Exposure(s)
- Fire and Explosion(s)
- Oxygen Deficiency
- Ionizing Radiation

1. Biologic Hazards

- Safety Hazards
- Reactivity Hazards

a) Heat Stress

To effectively manage these types of incidents, personnel must be familiar with the procedures, as well as utilize good common sense.

The National Fire Protection Association has established standards #471, #472 and #473. The following procedures are designed to comply with the current accepted standards as set forth by NFPA. The occupational Safety and Health Administration (OSHA) specified in the "Final Rule" (1910.120), elements of an emergency response plan. The following written procedures are designed to meet and exceed OSHA Standards and to guide Salt River Fire Department responders in mitigating the incident while, providing for responder and public safety.

INCIDENT CLASSIFICATION AND RESPONSES

Incidents are divided into three levels: Category I, II, and III. They are in ascending order of severity.

Category I Incidents

These are incidents that may be handled by first responders.

These incidents include buildings that are not placarded or the building is placarded with the NFPA 704 system with "0" or "1" in the three categories.

Department of Transportation Class 9 (miscellaneous) materials fall in this incident category. The
container(s) is/are of a small size, up to a 55-gallon drum (e.g., pails, buckets, lecture cylinders and drums). Typically the integrity of the container is not compromised. There is no fire, leak, or only a small leak that can be contained with common absorbents, easily over-packed or quickly stopped. There is no life-threatening impact from the materials involved. The environmental impact is minimal.

Category I Examples:

- Minor leaks or spills which can be handled with several shovels full of dirt or sand, or washed down with water.
- Minor leaks or spills within the capability of the driver or responsible party to handle with one engine or truck company assisting.
- Leaking propane cylinders < 20 gal. (May be Category II, if special equipment is needed.)
- Natural gas leaks outside, away from structures.

Response:

For suspected or known Category I Incidents involving hazardous materials, Alarm will dispatch a special assignment of the closest Ladder or Engine Company code 3. Alarm will also give all additional information pertinent to the situation, including type and size of incident and if there are known victims.

Category II Incidents:

At this level, the first responder is unable to mitigate the situation alone and requires the assistance of the Haz Mat Team.

A Category II incident is a medium incident that has hazardous risk factors proportional to the amount of product released or the potential release of the product.

A Category II Incident involves a product that is required to be placarded in transportation, or the building is placarded with the NFPA 704 system with a "2" in any of the three categories.

The container size is of a medium size (e.g., one-ton cylinders, portable containers, nurse tanks, and multiple small packages). A fire has erupted but the product or containers have not become involved yet. The leak cannot be controlled without special equipment. The life safety is localized and a limited evacuation area is foreseen. The environmental impact is moderate, and the container integrity is damaged but it is able to contain the contents, to allow for handling of off-loading of the product.

Category II Examples:

- Leaks of gasoline, diesel or other flammable or combustible liquids, where the quantity of spill is too large to wash down and the material will need to be picked up, or has a specific reportable quantity amount.
- A situation where firefighters' full protective clothing, with a S.C.B.A., is minimum protection against the material. Special protective clothing may be warranted.
- Exterior locations that present little possibility of accumulating hazardous vapors or gases.

Response:

For suspected or known Category II Incidents Alarm will dispatch the closest unit. If there is evidence of fire, Alarm will dispatch a structural response. The First Arriving Officer will request mutual aid Hazardous Materials Team Response.

Category III Incidents;

An incident that may be beyond the scope of the Mutual Aid Haz Mat Team due to the size and/or type of the product release. The need for outside agencies or resources that are greater than that of our own department's reserves may be required.

A Category III Incident may involve a product that is a poison gas, explosives, organic peroxide, flammable solid, materials that are dangerous when wet, or radioactive materials. It has a "3" or "4" in any of the NFPA 704 diamond categories, including special hazards, PCB's and fire, DOT

inhalation hazard, EPA Extremely Hazardous Substance, and cryogenics. The size of the container, is large (e.g., tank cars, tank trucks, stationary tanks, hopper cars/trucks, and multiple medium containers). The product or container is involved in fire. The leak cannot be controlled with special equipment. The life safety covers a large area and mass evacuations are called for. The product may have a severe effect on the environment. The container's integrity is damaged to the point that a catastrophic rupture is possible.

Category III Examples:

- Potential for harm to response personnel is high.
- Incidents that require special protective clothing in order to enter the scene to accomplish rescue and control actions.
- Infectious substances and known carcinogens.
- Situations requiring highly specialized leak/spill control equipment.

Response:

For Category III Incidents, a structural assignment will be dispatched.

Additional units may also be called for and Level II staging should be utilized. Category III incidents will require Hazardous Material and Major Incident call-out procedures to be followed.

FIRST RESPONDER OPERATIONAL:

The goal of first responders is to respond safely to hazardous material incidents.

First Responder Responsibilities:
- Establish Command/control (scene management).
- Detect the presence of hazardous materials.
- Begin identification.
- Evacuation.
- Emergency decontamination/personnel protection.
- Isolate incident/identify zones of activity.
- Contain incident if possible from an isolated position without risk of exposure.
- Seek additional appropriate resources.

These responsibilities are listed in order of priority.

Establishing Command/Control (scene management) when responding to an incident, responders should review dispatch information and if necessary, ask for additional information. Ideally, the initial dispatch should include:

Address; call back number and responsible party.
Material name and/or type.
Problem: leak, spill, fire, etc.
Amount and size of container(s).
Dangerous properties of the materials.
Weather conditions - wind speed and direction.
Category of incident - I, II or III.

First Arriving Unit

The first Fire Department Officer to arrive at scene of a hazardous materials incident shall assume Command and remain in charge until relieved by a higher ranking Officer, or transfer Command to the next arriving Officer.

Refer to Command Procedures, Section 201.01

Initial Report

The first arriving unit sets the stage for the entire incident. This unit shall transmit a brief initial radio report including:

IV. Unit identification on the scene and confirming assumptions of Command.
Conditions at the scene - fire, vapor cloud, leaking drums, victims, overturned gasoline tanker truck, etc.
Routing and positioning (staging) directions, upwind, uphill, etc.
Any actions that will be taken.

At the Scene

Review pre-emergency plans
Contact the responsible party, if known
Seek additional resources, if necessary to determine if on-scene resources are adequate, resources must be capable of accomplishing the following functions:
Isolate the area
Stabilize the scene
Decontaminate, treat, and transport victims
Protect property and the environment

Evacuate the surrounding area, if necessary

Size-up

A Haz Mat size-up assists responders in developing an action plan. When performing a size-up there are three steps to follow:

Gather information

Information may be gathered by:

Observation, the conscious effort of viewing the emergency situation. This visual picture should include any sights or sounds that would indicate responders are too close.

Reconnaissance, gathering information from facility managers, chemists, and engineers or by sending teams in to obtain information.

Hazardous Material Management Plans and Contingency Plans prepared and submitted by business industry.

Fire Department preplans that may include the physical layout of the facility, a list of chemicals and locations, Material Safety Data Sheets (MSDS) and the names and numbers of key personnel and agencies.

Identifying Priorities

After gathering all available information, the next step is to identify the priorities that need to be addressed, as quickly as possible. This can be accomplished by asking the right questions. The key areas that need questioning are:

Questions concerning the hazardous materials.
Questions relating to the rescue.
Questions involving the safety factors.
Questions about the buildings, vehicles, or containers that are involved.
Questions concerning the fire (if applicable).
Questions about weather conditions.
Questions about resources needed.

c) Events Analysis

The third step in accomplishing size-up is event analysis. Responders should ask these questions:

What events have taken place prior to our arrival?

What events may take place in the immediate future?
What actions may be taken and what would those actions accomplish?
What events will take place if conditions change?

Action Plan

Once responders have gathered all available size-up information, through all available means, an action plan should be developed.

The action plan must provide for:

Safety of responders, citizens, and victims, etc.
Evacuation of endangered areas
Control of the situation
Stabilization of the hazardous materials
Protection of property and the environment
Step by step procedures that will be followed
Disposal or removal of the hazardous materials

Detecting the Presence of Hazardous Materials To assist responders in performing size-up and recognizing and identifying hazardous materials, there are various clues that fit into seven categories.

They are:

Occupancy/location - through preplanning, inspection and familiarization activities, responders may learn where hazardous materials are stored, used, produced, or transported in their station response area.

Container shapes - the Department of Transportation (DOT) regulates the packaging used to transport hazardous materials. Usually, these materials are stored in the same container they are shipped in. If responders become familiar with container shapes, they may have a good idea of the physical state of the materials as well as the type of material in the container.

Markings/Colors - Markings such as the four digit United Nations numbers found on placarded vehicles provide an excellent clue. Markings within NFPA's 704 diamonds found on buildings are also available. The color on placards and labels identify materials into a hazard class. The 704 system also provides clues based on colors;

Blue - indicating health hazards
Red - flammability
Yellow - reactivity
White - special information.

Placards/Labels - Placards and labels are designed to alert responders of hazardous materials in transportation. Placards are 10-3/4" by 10-3/4", and are placed on vehicles, tankers and rail cars. Labels are 4" x 4" and are placed on individual containers smaller than 640 cubic feet in

size. Containers in storage usually retain their label, which can be easily recognized. Labels on cylinders will be on the top next to the valving.

Shipping Papers/Materials Safety Data Sheets (MSDS) Shipping papers which accompany a hazardous materials shipment provide the proper shipping name(s), the hazard class (es) and amounts.

Material Safety Data Sheets (MSDS) are required by OSHA to be sent by the manufacturer or chemical supply company to all buyers, when the chemical contains hazardous ingredients. OSHA also specifies that the MSDS include information in the following areas:

Chemical and common name
Ingredients
Physical and chemical hazards
Physical and chemical properties
Health information
Primary route(s) of entry
OSHA permissible exposure level (PEL)
Carcinogen - if known
Safety precautions
Handling precautions
First aid information

Name, address, phone number of manufacturer MSDS are required to be on the premises where hazardous materials are located and are an excellent reference source.

Monitoring/Detection Devices Plants and industrial sites may have monitoring devices on-sight that will detect material leaks. Remember many chemicals are odorless, colorless and can only be detected by meters. Request the Haz Mat Team when monitoring is needed beyond the capability of the initial companies.

Senses - Responders senses - smell, sound, touch or sight, are sometimes useful in detecting hazardous materials. However, some chemicals are undetectable or rapidly deaden your sense of smell. Irritation to the eyes or skin is a signal that responders are too close and should evacuate farther to a safe distance.

Begin Identification

If first responders detect the presence of hazardous materials, research needs to be completed to determine the dangers of the chemical(s) and to assist in determining the plan of action.

The following three reference books are on every response vehicle in the Salt River Fire Department.

Emergency Response Guidebook (ERG)
The ERG is the first reference material to be used. This book provides initial guidance as well as evacuation perimeters to follow.

Fire Protection Guide on Hazardous Materials (NFPA)
This book provides information on the hazardous properties of chemicals. It is a good reference manual to use on emergencies such as fires and accident spills.

NIOSH Pocket Guide to Chemical Hazards
This book provides information on exposure limits of chemicals. Additionally it provides other information such as trade names, properties, incompatibilities, personal protective equipment and health hazards.

The DOT ID is also given with a cross-reference made to the ERG guide number.

In addition to these three reference materials, utilize experience of people on the scene such as chemists and personnel familiar with the chemical(s) and processes. Ask for M.S.D.S. that are kept on-site.

The Haz Mat Team has many other reference books in their library as well as software on their response vehicle that contains information on 2700+ chemicals.

Evacuation

Identify the area of evacuation. Evacuation limits will be determined by Fire Department Command in consultation with the police supervisor at the scene. All personnel involved in the evacuation must be briefed on the danger they face and must be given proper protective clothing and respiratory protection.

Organization of Evacuation

Establish a Command post for both Police and Fire.

Assign units or companies to evacuate specific objectives (a building, a block, a street, etc.) and report completion.

Assign geographic sectors to supervise operations.

Evacuate personnel in the greatest danger first.

Remove all ignition sources in the evacuation area.

Advise personnel if evacuees are to be directed to a particular evacuation center.

Transportation may be needed to evacuate personnel.

Emergency Operating Center (E.O.C.)
The E.O.C. may be set up in case of large-scale evacuations.

Public Information
A Public Information Sector must be set up in the case of large-scale evacuations.
P.I.O. may communicate with radio and TV to make special announcements.
Alarm must also be informed of the situation to answer calls that will be coming from the public.

For further information, refer to: Evacuation 205.03

Decontamination/Personal Protection
Decontamination - Response personnel may encounter contaminated victims on incidents, or they may become contaminated themselves.

Responder contamination may take place in several ways:
Contacting vapors, mists, or particulate matter in the air.
Being splashed by materials while performing reconnaissance, diking spills, or sampling containers.
Walking through spills or contaminated soil.
Using contaminated clothing, instruments or equipment.

When contamination occurs, responders must perform emergency decontamination procedures.

Emergency decon requires a hose line, a diked area when possible, and decontamination personnel in full protective clothing.

The victim(s) is directed into the diked or decon area. If the victim(s) must be assisted, such assistance must be given with a minimum of direct handling until decontamination is completed. If protective clothing has been breached or there was an absence of protective clothing, the contaminated victim(s) must be stripped and then decontaminated.

Emergency decontamination follows five steps:
Personnel must be in full protective clothing.
Utilize a red line or 1-1/2" hose line to flush the victim(s).
Remove victim(s) clothing.

Continue flushing and contain runoff (if possible).
Provide treatment and transportation.

Full Decontamination

Full decontamination procedures will be completed with personnel in special protective clothing performed by the Haz Mat Team or supervised by Haz Mat personnel.

Initial arriving personnel must compare the level of protection available for their use (full protective clothing with S.C.B.A.) with the level of protection required to safely enter a hazardous environment. To assist responders in determining whether they can take offensive action to control the incident, there are certain factors that need to be known. If the following factors are known, then the responders can take action.

Materials are known and identified.
NFPA 704 ratings of 2 or less in health and reactivity with no special hazards.
Atmosphere contaminates, liquid splashes, or other direct contact will not adversely affect the responder.
No victims exposed to the hazardous material.
No adverse environmental impact.
Exterior locations that present little possibility of accumulating hazardous vapor or gases.

If all these factors are not known or only some are known and responders choose to take action, the responders should receive approval from Command and then they should take action quickly, limiting their exposure. The responders should then get out and get decontaminated immediately.

If hazardous materials are thought to be involved, the Haz Mat Team should be called early so special protective clothing may be used.

Isolate Incident/Identify Zones of Activity

Isolate Incident

Isolate the incident by keeping personnel, (civilian employees, public safety responders) away from the area, if they are not directly involved in emergency response operations.

Unprotected emergency responders should not be allowed within the isolation area. This "isolation" task should be done first, to get control of a place to work. This is the first step for any protective actions that follows:

The ERG book lists 500 feet as the minimum isolation area, and is a good rule of thumb to follow until additional information is obtained.

Identify zones of activity
Hazardous material incidents are divided into three separate zones of activity.

Hot Zone - the Hot (Exclusion) Zone is the area contaminated by the spilled material, whose perimeter is the Hot Line, which is usually marked with orange tape. Access into the Hot Zone is limited to only those persons necessary to control the incident. A log is to be maintained at the access control point to record entry and exit time of all personnel in the Hot Zone.

Warm (Decontamination) Zone - the Warm Zone is the area bounded by the hot line and the contamination control line. It is the area where personnel and equipment decontamination takes place. It always includes a corridor with access control points. The use of control points and a corridor will assist in reducing the spread of contamination.

Cold (Support) Zone - this Zone contains the Command post and such other support functions as are deemed necessary such as the rehab area and treatment area, and it is outside of the contamination control line which is usually marked with yellow tape.

Contain Incident

If Possible, from an Isolated Position without Risk or Exposure After all personal protection factors have been addressed (first six items of these procedures), only then should responders begin containment procedures. If responders can not do these tasks safely, they must remain in a safe location away from the incident. The following are techniques that may minimize risk to both life and the environment in the early stages of a spill or leak.

Absorption - using materials to soak up spills.

Dilution - using water to dilute water-soluble materials.

Dikes, Dams or Diversions - using physical barriers to prevent or reduce the quantity of liquid flowing into the environment.

Overpacking - using an oversize container that is compatible with the material and placing the container in the overpack.

Plug and Patch - using compatible plugs and patches to reduce or stop the flow of materials from holes, rips, tears, or gashes in containers.

Transfer - moving a material manually or by pump or pressure transfer from a leaking or damaged container or tank.

Vapor Suppression - using foam concentrates to eliminate or reduce vapor emission.

Venting - the controlled release of a material in order to reduce and contain the pressure and diminish the probability of an explosion.

Controlled Burning - a situation where extinguishing a fire will result in a large, uncontained volume of contaminated water, create a flammable/explosive atmosphere, threaten the safety of responders or the public.

Seek Additional Appropriate Resources

Once it is determined that additional resources will be required, they should be called. Resources may be for equipment, manpower or technical expertise. The following are examples of resources that may be called for:

Private

Shipper, manufacturer, transporter, clean-up contractors, Motorola, Poison Control, CHEMTREC, defuelers, or other technical specialists.

Local/Community

Utilities for gas or electrical emergencies, flooding, diking, heavy equipment, etc. Police Department, Engineering, Water Department, other Fire Departments, etc., SRP, Southwest Gas, Salt River Schools (buses, evacuation centers).

County

Health Department, Sheriff's Office, Air Pollution, Civil Defense, Highway Department, Local Emergency Planning Committee (L.E.P.C.), etc.

State

DPS Watch Commander is one of the most important resources; Where State assistance is required. Attorney General's Office, Department of Environmental Quality, Radiation Regulatory Agency, State Chemist, National Guard, Division of Emergency Services, etc.

Federal

Environmental Protection Agency, Drug Enforcement Administration, Alcohol Tobacco and Firearms, National Radiation Commission, Coast Guard, etc.

Volunteer Agencies

Red Cross and Salvation Army